

CHAPTER 4

REGULATORY OPTIONS: DESCRIPTIONS AND COSTS

This chapter describes the final technology options that are the basis for the final rule and presents EPA's estimates of the national-level aggregate compliance costs to regulated facilities. Section 4.1 describes the technology options considered by EPA during the development of this rulemaking. Section 4.2 presents EPA's estimates of the number of affected facilities. Section 4.3 presents EPA's estimates of the expected pre-tax costs (2003 dollars) to these regulated facilities as a result of the final regulation. More detailed facility cost information is provided in EPA's *Development Document* supporting the final regulation (USEPA, 2004).

4.1 OPTION DESCRIPTION

4.1.1 Final Option

- **Final Option** includes narrative standards for the control of solids based on implementation through BMPs addressing (1) feed management, (2) cleaning and maintenance, (3) storage of feed, drugs and pesticides to prevent spills, (4) record keeping on feed, cleaning, inspections, maintenance, repairs, and reporting requirements.

4.1.2 Options Discussed in 2003 Notice of Data Availability

Based on comments received on the proposed rule, detailed questionnaire data (which was not available at the time of proposal), and effluent monitoring (DMR) data received from EPA regional and State permitting authorities, EPA developed two additional options for consideration:

- **Option A** includes (1) primary settling, (2) the requirement to develop and implement a BMP plan that minimizes both the discharge of drugs and chemicals and the possible escape of non-native species, and (3) the requirement for reporting Investigational New Animal Drugs (INADs) and extra-label use drugs as included in the proposed Option 2. The only difference between Option A and the proposed Option 2 is that Option A does not require the development and implementation of BMPs to address solids control.
- **Option B** is similar to the proposed Option 3 in that it would require a greater degree of solids removal than achieved under Option A. However, Option B would offer facilities the choice to develop and implement a solids control BMP as included in Option 1 in lieu of installing secondary solids control technology, such as a second stage settling pond or a microscreen filter, and meeting numeric TSS limits. Facilities could still choose to install solids polishing technology and monitor TSS to achieve a numeric limit, but they could alternatively choose to instead implement solids control BMPs such as feed management.

4.1.3 Proposal Options

For the 2001 proposal (USEPA, 2002), EPA subcategorized the concentrated aquatic animal production (CAAP) facilities into flow-through, recirculating, and net pen production systems and considered three options for incremental pollution control:

- **Option 1** for flow-through systems includes primary settling (e.g., quiescent zones and settling basins) and developing and implementing a BMP plan for solids control; for recirculating systems includes similar technologies/practices to those for flow-through systems; for net pens includes feed management and BMP plan development for solids control.
- **Option 2** for all subcategories combining the Option 1 requirements with identifying and implementing BMPs to control discharges of drugs, chemicals, and non-native species; also includes a reporting requirement for the use of Investigational New Animal Drug (INAD) and extra-label use drugs.
- **Option 3** combines Option 2 requirements with solids polishing (e.g., microscreen filtration) for flow-through and recirculating systems and active feed monitoring for net pens.

Table 4-1 identifies the components or technologies associated with each option for flow-through and recirculating systems. For net pen systems, Option B is the same as Option 3. EPA provided the public and the regulated community with the information about the additional options in its Notice of Data Availability (USEPA, 2003). This section summarizes EPA's estimated total regulatory costs for each of these options, including the technology option promulgated for the final regulation.

**Table 4-1
Technologies or Practices by Option**

Options	Technologies or Practices				
	Primary Settling	Solids Control BMPs	Drugs & Chemicals BMPs	Escape Prevention	Secondary Solids Removal
Final		✓	✓		
1	✓	✓			
2	✓	✓	✓	✓	
3	✓	✓	✓	✓	✓
A	✓		✓	✓	
B*	✓	✓	✓	✓	✓

* Option B would include primary settling, drugs and chemicals BMPs, escape prevention, and a choice between solids control BMPs or secondary solids removal technology.

4.2 TREATMENT IN PLACE AND BASELINE CONDITIONS AMONG COMMERCIAL OPERATIONS

The detailed questionnaire collected information at each facility as of 2001. EPA evaluates the treatment in place at each facility as of 2001. If a facility has an option component in place, EPA does not assign a cost for that component to the facility. The number of facilities that incur costs and are included in the impact analyses therefore varies by option. Table 4-2 summarizes the counts for the facilities that incur costs under the final regulation. Among the 101 commercial facilities, 32 are baseline closures. When net income is assumed as the basis for earnings, 43 facilities become baseline failures. That is, the use of cash flow for earnings results in a larger number of facilities in the cost and impact analysis for the industry. As discussed in Section 2.1 the count of noncommercial facilities includes Federal, State, Tribal, and Alaska nonprofit facilities.

Table 4-2
Estimated Number of Facilities With Production > 100,000 lbs/yr

Production System	Owner	Estimated Number of Facilities		
		In-Scope	Baseline Closures	In Analysis and Incur Costs ¹
Flow Through and Recirculating	Commercial	82	24	58
	Non-commercial	139	NA	139
Net Pen	Commercial	19	8	12
	Non-commercial	0	NA	0
Total	Commercial	101	32	69
	Non-commercial	141	NA	141

NA: not applicable.

¹In-analysis counts are calculated by taking in-scope facilities then subtracting out baseline closures.

4.3 SUBCATEGORY AND INDUSTRY COSTS

The Notice presented costs for all facilities with flow-through, recirculating, or net pen systems that met the definition of a regulated concentrated aquatic animal production, i.e., the costs for facilities with 20,000 lbs/yr and greater production were included in the cost, nutrient cost-effectiveness, and cost-reasonableness analyses (USEPA, 2003). For promulgation, EPA is restricting the scope of the rule to facilities with greater than 100,000 lbs/yr of production. As a result, the detailed questionnaire data identified no academic/research operations within the scope of the rule.

The capital, one-time, and annual operating and maintenance costs are annualized using the approach described in Section 3.1. Annualized costs are by production system and owner. EPA estimates the annual incremental costs of compliance using the capital and recurring costs derived in the *Development Document* (USEPA, 2004). Annualized costs better describe the actual compliance costs

that a regulated aquaculture facility would incur, allowing for the effects of interest, depreciation, and taxes. EPA uses these annualized costs to estimate the total annual compliance costs and to assess the economic impacts of the final requirements to each regulated operation. All costs presented in this section are converted from 2001 dollars to 2003 dollars using the Construction Cost Index (ENR, 2004).

Table 4-3 present EPA's estimated pre-tax and post-tax costs of the final regulation, respectively. The post-tax costs reflect the fact that a regulated operation would be able to depreciate or expense these costs, thereby generating a tax savings. Post-tax costs thus are the actual costs the regulated facility would face. Post-tax costs are also used to evaluate impacts on regulated facilities using a discounted cash flow analysis. Pre-tax costs reflect the estimated total social cost of the regulations, including lost tax revenue to governments. Pre-tax dollars are used when comparing estimated costs to monetized benefits that are estimated to accrue under the final regulations (see Sections 7 and 8 of this report).

Table 4-3
Pre-tax & Post-tax Annualized National Costs, Total by Subcategory and Option

Production System	Owner	Total Annualized Cost (Thousands, 2003 Dollars) ¹					
		Final	Option A	Option B	Option 1	Option 2	Option 3
Pre-Tax Annualized Cost							
Flow Through and Recirculating	Commercial	\$256	\$90	\$258	\$194	\$251	\$634
	Non-commercial	\$1,149	\$717	\$1,382	\$1,221	\$1,384	\$2,235
Net Pen	Commercial	\$36	\$0	\$0	\$0	\$0	\$0
	Non-commercial	\$0	\$0	\$0	\$0	\$0	\$0
Total		\$1,442	\$807	\$1,640	\$1,415	\$1,635	\$2,869
Post-Tax Annualized Cost							
Flow Through and Recirculating	Commercial	\$202	\$79	\$203	\$146	\$197	\$565
	Non-commercial	\$1,149	\$717	\$1,382	\$1,221	\$1,384	\$2,235
Net Pen	Commercial	\$11	\$0	\$0	\$0	\$0	\$0
	Non-commercial	\$0	\$0	\$0	\$0	\$0	\$0
Total		\$1,362	\$796	\$1,585	\$1,367	\$1,581	\$2,800

Note: Totals may not sum due to rounding.

Estimated by EPA.

¹ EPA converted costs from 2001 dollars to 2003 dollars using the Construction Cost Index (Engineering News Record, 2004). Costs are for facilities that are not baseline closures under a cash flow analysis.

For noncommercial facilities, the cost estimates are the same in both the pre-tax and post-tax tables since EPA assumes no tax savings for these facilities. EPA estimates national costs on the number of facilities expected to incur compliance costs if they exceed the production threshold in the final rule. That is, EPA includes all facilities that are not baseline closures and those for which EPA could not make a baseline closure determination (e.g., start-up operations or facilities with insufficient data) under the cash flow assumption.¹⁶

The estimated annualized costs for the final regulation is \$1.4 million. Noncommercial facilities account for about 80 percent of the total cost of the rule. These estimated total costs reflect aggregate compliance costs incurred by facilities that produce more than of 100,000 lb/year and will be affected by today's final regulation.

For comparison, Table 4-3 also presents estimated costs across a range of technology options considered by EPA during the development of this rulemaking.

4.4 COST-REASONABLENESS

EPA performed an assessment of the total cost of the final rule relative to the expected effluent reductions. EPA based its "Cost Reasonableness" (CR) analysis on estimated costs, loadings, and removals. EPA estimates BOD and TSS removals for each facility for each option. Because BOD can be correlated with TSS, EPA selected the higher of the two values (not the sum) to avoid possible double-counting of removals. Option costs include costs for certain BMP components that are not part of the final rule address [need clarification]. That is, EPA's cost-reasonableness values are likely overstated.

The Cost Reasonableness for the Flow Through and Recirculating subcategory is \$2.77. Cost-reasonableness is undefined for the Netpen subcategory because facilities in this groups has adequate treatment to achieve requirements for pollutants (i.e., no incremental removals are estimated). See EPA's Development Document (USEPA, 2004) and ERG, 2004 in the rulemaking record for additional details.

4.5 REFERENCES

ERG (Eastern Research Group). 2004. Aquaculture Cost-Reasonableness. Memorandum to Chris Miller, EPA. June 10.

ENR (Engineering News Record). 2004. Construction cost index history, 1908-2004. Engineering News Record. Downloaded April 1, 2004
<http://enr.construction.com/features/conEco/costIndexes/constIndexHist.asp>

USEPA (U.S. Environmental Protection Agency). 2004. Development Document for the Final Effluent Limitations Guidelines and Standards for the Aquatic Animal Production Industry. Washington, DC: U.S. Environmental Protection Agency, Office of Water.

¹⁶ The number of baseline closures increases under net income analysis, implying that national costs decrease under EPA's net income analysis.

USEPA (U.S. Environmental Protection Agency). 2003. Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category; Notice of Data Availability; Proposed Rule. 40 CFR Part 451. *Federal Register* 68:75068-75105. December 29.

USEPA (U.S. Environmental Protection Agency). 2002. Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category; Proposed Rule. 40 CFR Part 451. *Federal Register* 67:57872-57928. September 12.